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1. General Information

- Symbol: Ne
- Atomic Number: 10
- Atomic Mass: 20.180 u
- Group: 18 (Noble Gases)
- Period: 2
- Block: p-block
- Electron Configuration: $1s^2\ 2s^2\ 2p^6$
- Valence Electrons: 8 (Full outer shell)
- Phase at Room Temperature: Gas

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2. Isotopes of Neon

Isotope	Protons	Neutrons	Abundance	Notes
^{20}Ne	10	10	90.48%	Most abundant.
^{21}Ne	10	11	0.27%	Stable, trace amounts.
^{22}Ne	10	12	9.25%	Stable, second most abundant.

3. Physical Properties

- Color: Colorless (glows reddish-orange in electric discharge)
- Odor: Odorless
- Density: 0.9002 g/L (at STP)
- Melting Point: -248.6°C
- Boiling Point: -246.1°C
- State at STP: Gas
- Non-metallic and Monatomic: Exists as Ne atoms.

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4. Chemical Properties

- Inert and Non-reactive – Does not easily form compounds.
- Stable Electron Configuration: Full outer electron shell.
- Non-flammable and non-toxic.
- No Known Stable Neon Compounds under normal conditions.

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5. Occurrence and Abundance

- Fifth most abundant element in the universe.
- On Earth:
    - Atmosphere: 0.0018% by volume.
    - Crust: Trace amounts.
    - Stars and Solar Wind: Produced by stellar nucleosynthesis.
- Extracted by fractional distillation of liquefied air.

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6. Industrial Production of Neon

- Method:

    - Fractional distillation of liquid air (Neon is separated from other noble gases and nitrogen).
- Source Material: Atmosphere.

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7. Uses of Neon

Application	Description
Neon Signs	Glows reddish-orange in electric discharge.
High-voltage Indicators	Neon is used in indicator lights.
Television Tubes	Used in gas discharge tubes for displays.
Lasers	Neon gas is part of helium-neon (HeNe) lasers.
Cryogenics	Liquid neon is used as a cryogenic refrigerant.
Scientific Research	Used in vacuum tubes and high-energy physics.

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8. Neon in Lighting

- Color Emission:
    - Glows reddish-orange in low-pressure discharge tubes.
    - Different gases (e.g., argon, helium) produce different colors.
- Neon Lights:
    - Often mixed with argon or mercury to produce other colors.
    - Pure neon glows red, while argon glows blue or purple.

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9. Biological Role of Neon

- Non-toxic and Biologically Inert: Neon has no biological role.
- Inhalation: Safe to inhale in small amounts but displaces oxygen in confined spaces.

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10. Safety and Hazards

- Non-reactive and Non-flammable.
- Asphyxiation Hazard: Can displace oxygen in confined spaces, leading to suffocation.
- Stored as a Compressed Gas: Handle under high pressure with care.

Fun Facts About Neon:

- Discovered in 1898 by William Ramsay and Morris Travers.
- Neon signs were first introduced in 1910 by Georges Claude.
- Neon is rare on Earth but abundant in the universe and stars.
- The term “neon lights” is often used for all gas discharge tubes, even if they use gases other than neon.